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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,355	12/19/2005	Gerard Hillion	PET-2170	2996
23599 7590 06/26/2008 MILLEN, WHITE, ZELANO & BRANIGAN, P.C. 2200 CLARENDON BLVD. SUITE 1400 ARLINGTON, VA 22201				
EXAMINER				
BULLOCK, IN SUK C				
ART UNIT		PAPER NUMBER		
1797				
MAIL DATE		DELIVERY MODE		
06/26/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/519,355

Applicant(s)

HILLION ET AL.

Examiner

In Suk Bullock

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SG/08)
Paper No(s)/Mail Date 12/28/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed 12/28/04 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. Reference DE 1110941 was not received and, therefore, this reference has not been considered.

Please note that reference listed as 2001005758 has been corrected to 20010005758.

Claim Objections

Claim 7 is objected to because of the following informalities: it appears that "the reactor" as recited in line 2 of the claim should be changed to "the reducing agent".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear what "it" is suppose to be dissolved in a solvent.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-11 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 3,917,737 to Yoo (hereinafter "Yoo").

Yoo discloses a hydrogenation of a diolefin compound (col. 8, lines 47-68) using a catalyst comprising a minor catalytically effective amount of (a) a metal selected from iron, cobalt, nickel and mixtures thereof, (b) an organometallic reducing agent, and (c) a ligand (col. 1, lines 24-48). The transition metal is selected from halides and acetylacetonates (col. 3, lines 22-23), the organometallic reducing agent is at least one metal selected from Group IA (i.e., lithium, sodium) and IIIA (i.e., aluminum) (col. 3, lines 28-32), and the ligand may be hydrocarbon-substituted organophosphines or hydrocarbon-substituted electron donor ligands of Group VA (col. 4, lines 12-33). Complex of the metal source and the organoaluminum compound, with or without the ligand, may be prepared in solution, i.e., aromatics and aliphatic hydrocarbons (col. 7, lines 43-51).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 12 and 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 3,917,737 to Yoo (hereinafter "Yoo").

Yoo discloses a hydrogenation of a diolefin compound (col. 8, lines 47-68) using a catalyst comprising a minor catalytically effective amount of (a) a metal selected from iron, cobalt, nickel and mixtures thereof, (b) an organometallic reducing agent, and (c) a ligand (col. 1, lines 24-48). The transition metal is selected from halides and

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acetylacetonates (col. 3, lines 22-23), the organometallic reducing agent is at least one metal selected from Group IA (i.e., lithium, sodium) and IIIA (i.e., aluminum) (col. 3, lines 28-32), and the ligand may be hydrocarbon-substituted organophosphines or hydrocarbon-substituted electron donor ligands of Group VA (col. 4, lines 12-33).

Complex of the metal source and the organoaluminum compound, with or without the ligand, may be prepared in solution, i.e., aromatics and aliphatic hydrocarbons (col. 7, lines 43-51). Yoo further discloses the amounts of the reducing agent per mole of iron, cobalt or nickel is about 5 to 30 (col. 1, lines 49-54) and the molar ratio of ligand to iron, cobalt or nickel is often about 0.5 to 15:1 (col. 2, lines 31-33).

Yoo fails to disclose that the principal metal is iron and the additional metal is selected from Co, Ni, Cu, Rh, Pd, Mn, Mo, W, and V.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Yoo by selecting any combination of the three metals disclosed, Fe, Co, and Ni including the claimed combination with an expectation of achieving relatively equivalent results.

With regard to source of the feed (claims 22 and 23), it is well known that a C₄ cut comprises 1,3-butadiene.

Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 3,917,737 to Yoo (hereinafter "Yoo") in view of US Patent 6,040,263 to Mussmann et al. (hereinafter "Yoo").

Yoo fails to disclose using an ionic liquid as a solvent.

Mussmann discloses hydrogenation of diolefins using a catalyst comprising transition metal complex with ligands (col. 3, lines 5-35 and col. 4, lines 4-17). Mussmann further discloses using non-aqueous, ionic solvent to at least partially dissolve the catalyst (col. 1, line 51 to col. 2, line 67).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Yoo by utilizing the non-aqueous, ionic solvent as disclosed by Mussmann to produce a homogeneous catalyst because it would make the process simpler and cheaper to operate since it does not have to use fixed bed, moving bed, or fluid beds.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to In Suk Bullock whose telephone number is 571-272-5954. The examiner can normally be reached on Monday - Friday 6:00-2:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/In Suk Bullock/
Examiner, Art Unit 1797